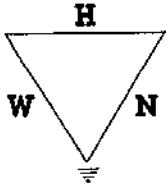


DEC 16 1991



Wagner, Heindel, and Noyes, Inc. consulting geologists

P.O. Box 1629 Burlington, Vermont 05402-1629 802-658-0820

December 13, 1991

#91-1048

Mr. Chuck Schwer
Agency of Natural Resources
103 South Main Street
Waterbury, VT 05676

Re: McKenzie Meat Packing
Investigation and Remediation of Gasoline Contaminated Soils

Dear Chuck:

Enclosed is our report detailing the results of our investigation and remediation of gasoline contaminated soils at the McKenzie property in Burlington.

All contaminated soils were removed from the subsurface and stockpiled on-site. Please review our findings and recommendations and let us know if you concur.

We look forward to your comments. Please call either me or Jeff Noyes with any questions.

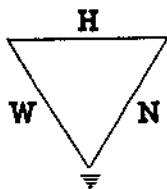
Best regards,

Robert W. Rooks
Environmental Engineer

RWR/tjr

Enclosures

cc: Mary Alice McKenzie (w/report)



Wagner, Heindel, and Noyes, Inc. consulting geologists

P.O. Box 1629 Burlington, Vermont 05402-1629 802-658-0820

McKENZIE PACKING COMPANY
456 North Street
Burlington, Vermont

INVESTIGATION AND REMEDIATION
OF GASOLINE CONTAMINATION

Prepared by:

Robert W. Rooks
Environmental Engineer

Reviewed and Approved by:

Jeffrey E. Noyes
Chief Hydrogeologist

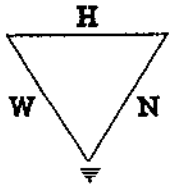
December 12, 1991

McKENZIE PACKING COMPANY
456 North Street
Burlington, Vermont

**INVESTIGATION AND REMEDIATION
OF GASOLINE CONTAMINATION**

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| 4.0 RISK ASSESSMENT | 3 |
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Wagner, Heindel, and Noyes, Inc. consulting geologists

P.O. Box 1629 Burlington, Vermont 05402-1629 802-658-0820

McKENZIE PACKING COMPANY
456 North Street
Burlington, Vermont

INVESTIGATION AND REMEDIATION
OF GASOLINE CONTAMINATION

1.0 INTRODUCTION

On November 20, 1991, Wagner, Heindel, and Noyes, Inc. conducted investigative work to determine the extent of gasoline contamination discovered during the removal of a 3,000-gallon gasoline tank on the McKenzie Packing Company property located at 456 North Street in Burlington, Vermont.

Contaminant extent was determined by first re-opening the original tank excavation. The excavation was then extended both vertically and laterally until no further contamination could be detected. Soils screening was performed using an H-Nu PI-101 photoionization detector with a 10.2 eV lamp.¹ A conservative value of 10 units (calibration gas equivalent) was used as a delimiter of "clean" vs "dirty" soils. Volatile organic vapor measurements were made using the in-hand method.

Prior to the start of excavation work, groundwater samples were collected from the two monitoring wells installed at the time of tank removal. Laboratory results are included in pages 4 and 5 of the Attachment. EPA Method 418.1 detected no petroleum hydrocarbons in the diesel tank excavation. Low levels of ethylbenzene and toluene, along with a number of unidentified peaks, were detected at the former gasoline tank site.

As a component of the follow-up work, soils stockpiled during the removal of the gasoline tank, the 5,000-gallon diesel tank, and the waste oil tank were screened with the PID. Soils exhibiting volatile organic vapor concentrations of less than 5 units were thin-spread on site.

¹ Calibrated to benzene, 11-20-91.

2.0 EXTENT OF CONTAMINATION

Page 1 of the Attachment shows a sketch of the site. As shown, contaminated soils were found to extend several feet laterally in all directions from the original tank location. Vertically, elevated PID readings were recorded to a depth of approximately 1 to 2 feet beneath the former base of the tank.

The excavation was initially opened to a depth of 6 feet out to the line labeled, "Limits of Excavation" on the sketch. No contaminated soils were encountered to this depth. The excavator then moved into the hole and worked from this new base elevation. Excavation continued until no further contaminated soils could be found. Numerous samples collected from the sides and base of the excavation were screened. Maximum depth of excavation was approximately 12 feet below ground surface.

Soils throughout the excavation were found to be silty fine to medium sands, with the exception of gravel fill used as backfill during the original tank pull. Soils were observed to be very tight, as noted by the very slow rate of water infiltration into the open excavation. One 6"-thick band of more permeable material was observed at a depth of approximately 7 feet below ground surface. A very dense pattern of soil sampling was performed in this horizon and showed no elevated PID readings at the limits of excavation.

Based on the findings of this work, all contaminated soils associated with the UST site have been removed. No further subsurface remediation work is warranted. Two monitor wells were installed in the excavation to facilitate future sampling and analysis if deemed necessary.

3.0 CONTAMINATED AND STOCKPILED SOILS

Approximately 60 yards of contaminated soil were removed from the excavation. These materials exhibited PID readings ranging from 5 to 100 units. A new stockpile was created at the location shown on the sketch and consists of an 18' x 33' bermed area lined with black polyethylene. The pile was covered with black poly upon completion of work.

Soils stockpiled during the two previous tank removal projects on the property were sampled at numerous locations and screened for volatile organic vapors. A conservative limit of 5 PID units was used to define contaminated soils.

One portion of the gasoline-contaminated soil pile (Pile B on sketch) revealed elevated PID readings. These materials (approximately 2½ yards) were segregated and added to the new stockpile. All other grab samples showed PID readings equivalent to or less than background. Clean soils were thin-spread to a depth of 2 to 3 inches on the site.

We recommend on-site treatment of the newly-stockpiled soils via forced aeration. Page 2 of the Attachment shows a sketch of our proposed design for implementing such a system. Our proposal is for a simple system consisting of several screened vertical collection points, a Rotron blower, and granular activated carbon treatment of vapors. As the costs for this work are eligible for Petroleum Cleanup Fund reimbursement (or deductible), a cost estimate is provided on page 3 of the Attachment.

4.0 RISK ASSESSMENT

A sensitive receptor assessment was prepared by the Sites Management Section in June of 1991. That analysis identified 6 water supply wells and one surface water body (Winooski River) within a .75 mile radius of the site. Five of these wells are located at the McNeil Generating Plant, 0.5 miles to the north. The sixth is located at Newton's Car Wash, 0.5 miles to the east. Based on the apparent direction of groundwater flow, neither of these locations is hydraulically downgradient of the McKenzie property. Additionally, these water supplies are not potable sources.

To supplement this work, an independent survey of residential dwellings in the vicinity was conducted. No well casings were observed on any nearby properties. In addition, each home was inspected for an outdoor water meter readout device, indicating service by the municipal water system. All neighboring and nearby homes had such devices.

Based upon surficial topography and our knowledge of groundwater flow characteristics in the area, groundwater flow is likely in a predominantly westerly direction. All downgradient properties are residential in nature.

Excavation work performed on the site indicated that all contaminant has been removed from the subsurface. As such, there is no continued threat to groundwater, soils, surface waters, or water supplies.

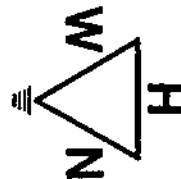
5.0 CONCLUSIONS

All gasoline-contaminated soils were removed from the subsurface during excavation work on the site. These soils were stockpiled in a polyethylene-lined bermed area and constitute approximately 60 yards of material. We recommend that the soils be remediated via encapsulation and forced aeration until vapor levels are sufficiently reduced. Following successful treatment, soils will be thin-spread on the site.

Further remedial work on the site is unwarranted, based upon the results. As required by the Sites Management Section, a groundwater sample was collected from a newly-installed monitor well (MW-1) to confirm that groundwater impacts do not exceed State regulatory standards. Results of this analysis will be forwarded as soon as they are available.

Soils stockpiled during the two previous tank removal projects were sampled and screened for elevated VOC levels. Clean materials were thin-spread on site. A small volume (2-3 yards) of contaminated materials was incorporated into the new stockpile.

Assuming that the water quality results are satisfactory, we recommend that no further groundwater monitoring be required. With final disposition of the soil stockpile, we recommend that the site be closed.

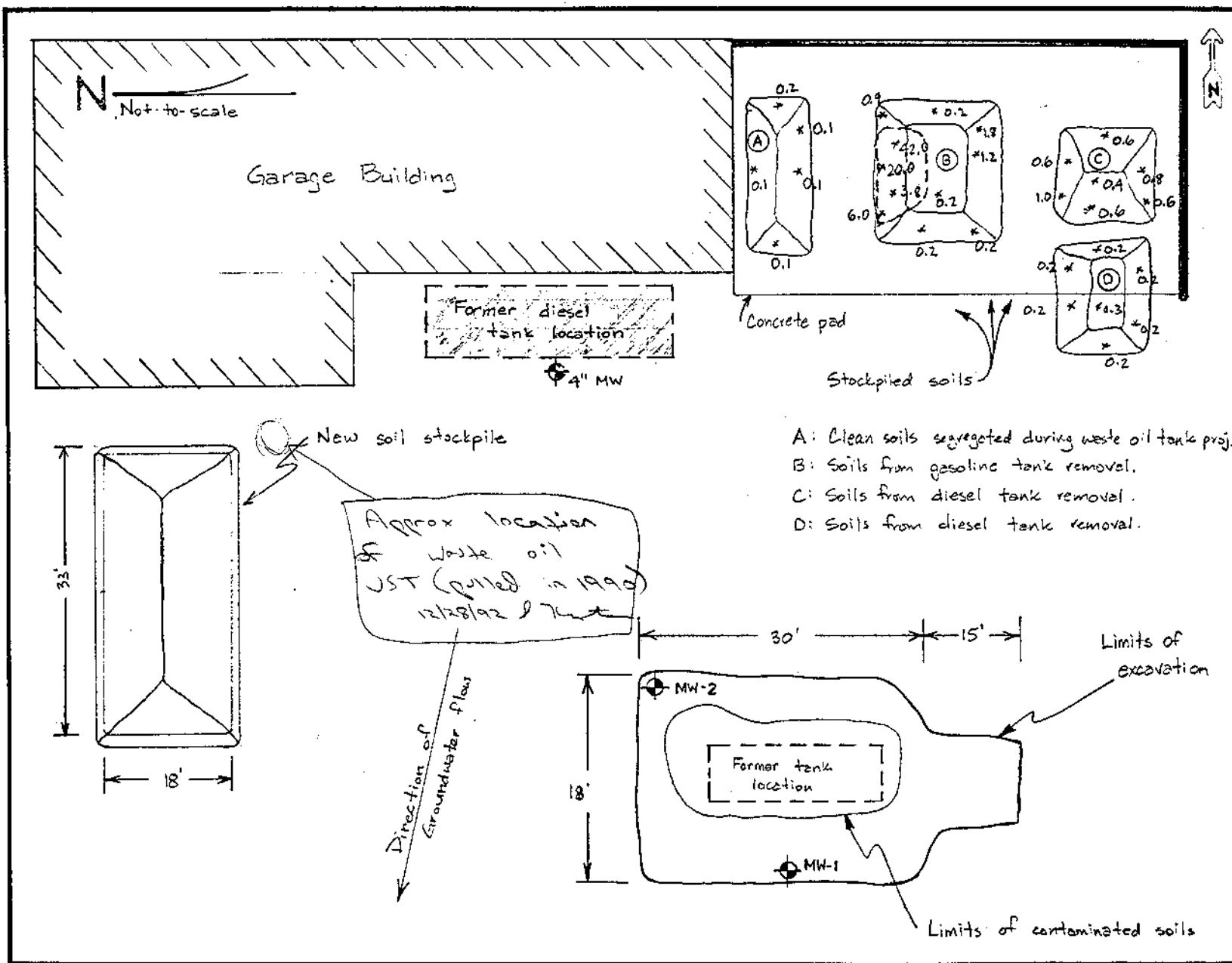


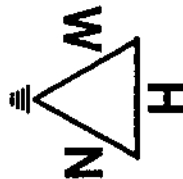
Wagner, Heindel, and Noyes, Inc.
Consulting Geologists
Burlington, Vermont

PAGE 1 OF 5
PROJECT: McKenzie
DATE: 11-27-91

Page No.

1





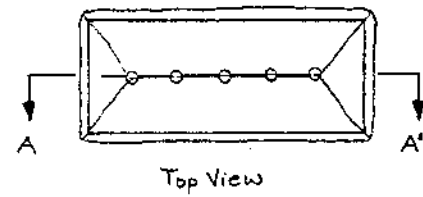
Wagner, Heindel, and Noyes, Inc.
Consulting Geologists
Burlington, Vermont

PAGE 2 OF 5
PROJECT: Mckenzie
DATE: 12.5.91

Page No.

2

Soil Stockpile Aeration System



Top View

PVC Manifold

Vapor phase
GAC

To atmosphere

Filter

Moisture
Trap

Rotron
Blower

Screen

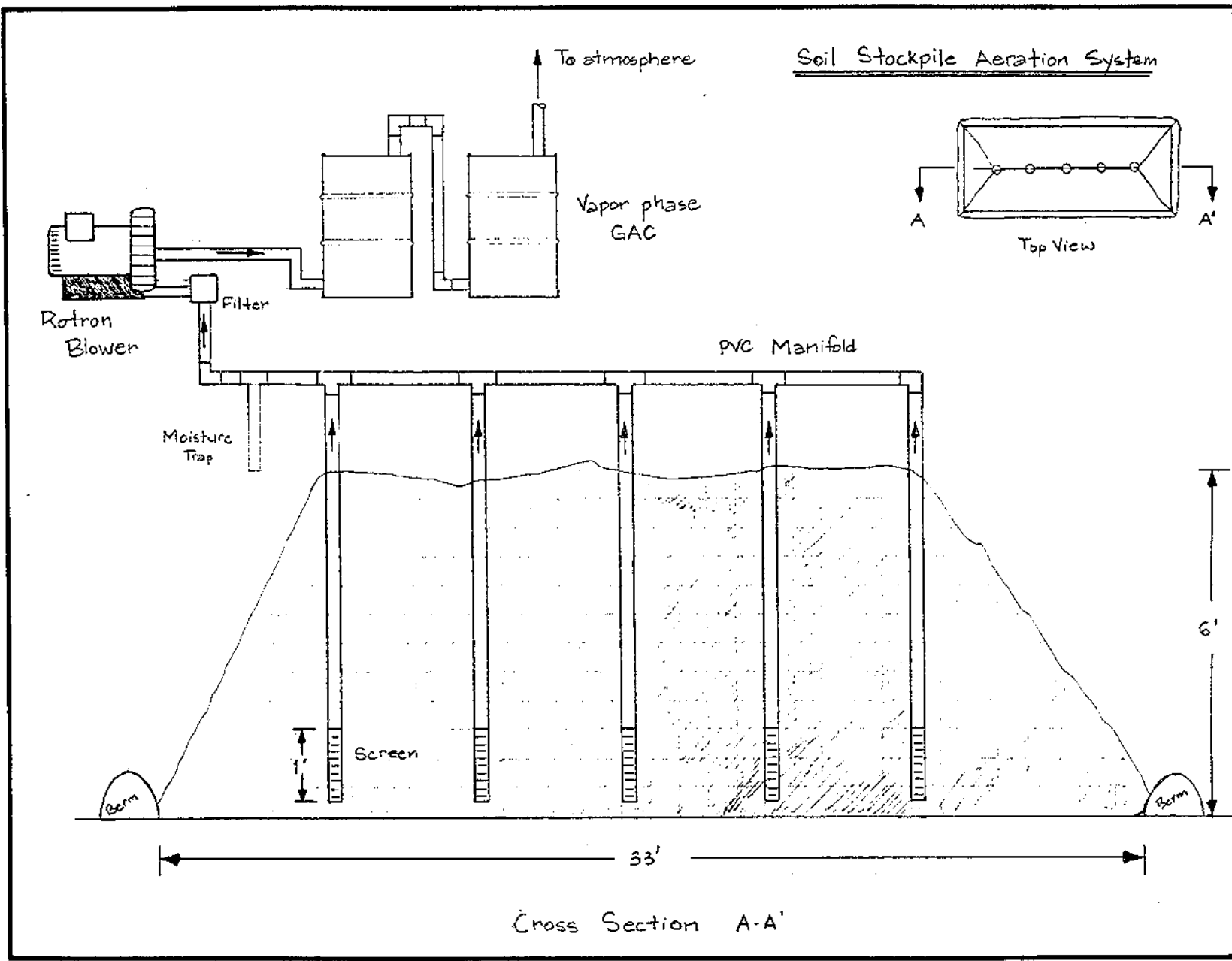
Cross Section A-A'

33'

6'

Berm

Berm



McKENZIE PACKING COMPANY
Burlington, Vermont

SOIL STOCKPILE AERATION SYSTEM
COST ESTIMATE

December 12, 1991

SYSTEM INSTALLATION

Hand-install vapor extraction points using hand-slotted screen sections and 2" solid PVC riser. Construct manifold system with vacuum gauges, valves, air monitoring ports as required. Install blower, filter, gauges, water trap, vapor phase carbon canisters. System start-up.

| | |
|--|-------------------|
| • Engineer/Hydrogeologist: 8 hrs. x \$35/hr. | \$280.00 |
| • Staff Geologist: 8 hrs. x \$25/hr. | \$200.00 |
| • Materials, fittings, gauges | \$250.00 |
| • Shed | \$500.00 |
| • Electrical work (requires temporary service) | \$400.00 |
| • Activated carbon: Assume use of LAG recycled materials | \$0.00 |
| • Blower rental: 1 month x \$250/mo. | \$250.00 |
| | \$1,880.00 |

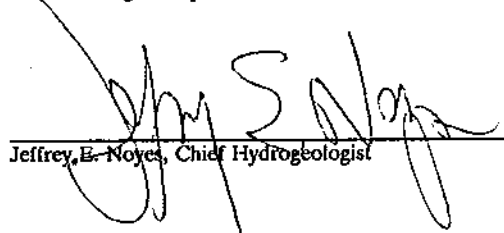
MONTHLY OPERATION AND MAINTENANCE

Maintenance visits to check blower performance, empty vapor traps, vacuum gauge readings, PID readings. Carbon change as necessary. Does not include costs of replacement carbon. Use recycled carbon.

| | |
|---|-----------------|
| • Weekly visits: 4 visits x 1 hr/visit x \$30/hr. | \$120.00 |
| • Electricity (estimated) | \$250.00 |
| • PID rental: 4 days x \$40/day | \$160.00 |
| | \$530.00 |

STANDARD TERMS AND CONDITIONS:

1. This is not a not-to-exceed cost estimate. Costs will not exceed 20% of the total specified herein without prior authorization of the client.
2. This estimate is based on standard field conditions. Extreme weather conditions may result in increased costs.
3. Meetings and phone consultations outside this scope of services will be billed on a time-and-materials basis.


 Jeffrey B. Noyes, Chief Hydrogeologist

12.12.91
 Date

Mary Alice McKenzie

Date


ENDYNE, INC.
Laboratory Services

 32 James Brown Drive
 Williston, Vermont 05495
 (802) 879-4333
 FAX 879-7103

LABORATORY REPORT
EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Wagner, Heindel, and Noyes, Inc.

PROJECT NAME: McKenzie

REPORT DATE: December 3, 1991

ANALYSIS DATE: November 29, 1991

SAMPLER: Jeff Hardy

STATION: Gasoline Tank Site

DATE SAMPLED: November 18, 1991

REF.#: 26,011

DATE RECEIVED: November 18, 1991

TIME SAMPLED: 2:29

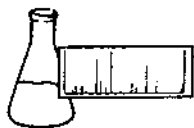
| <u>Parameter</u> | <u>Minimum Detection Limit</u> | <u>Concentration (ug/L)</u> |
|---------------------|--------------------------------|-----------------------------|
| Benzene | 2. | ND ¹ |
| Chlorobenzene | 1. | ND |
| 1,2-Dichlorobenzene | 2. | ND |
| 1,3-Dichlorobenzene | 2. | ND |
| 1,4-Dichlorobenzene | 2. | ND |
| Ethylbenzene | 1. | TBQ ² |
| Toluene | 1. | 1.22 |
| Xylenes | 5. | ND |
| MTBE | 1. | ND |

NUMBER OF UNIDENTIFIED PEAKS FOUND: 14

NOTES:

- 1 None detected
- 2 Trace below quantitation limits

Reviewed by



ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

TOTAL HYDROCARBONS - EPA METHOD 418.1

CLIENT: Wagner, Heindel, and Noyes, Inc.
REPORT DATE: December 4, 1991
PROJECT NAME: McKenzie
DATE SAMPLED: November 18, 1991
DATE RECEIVED: November 18, 1991
DATE ANALYZED: December 2, 1991
SAMPLER: Jeff Hardy

Reference number:

Concentration (mg/L)¹

26,010

ND²

Sample ID:

26,010: Diesel Tank Site; 2:10

Notes:

- 1 Method detection limit is 0.8 ppm
- 2 None detected

Reviewed by